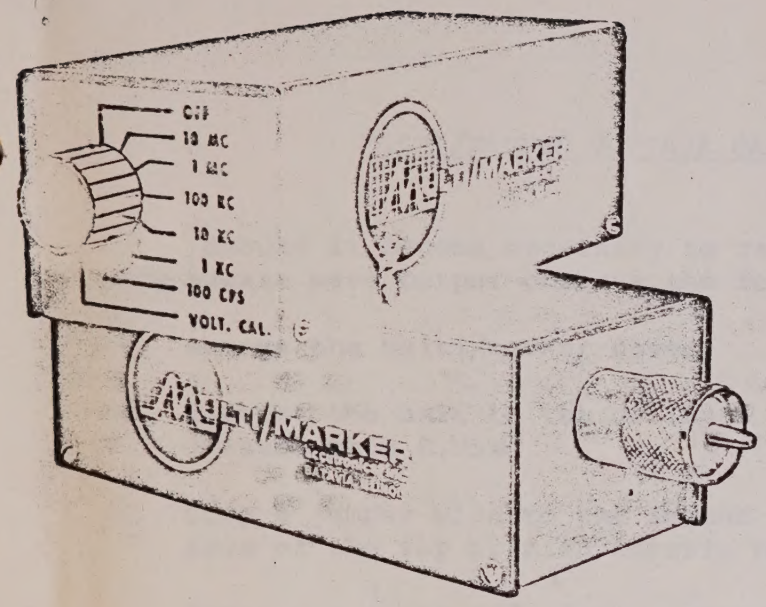
ACCUTRONICS

MULTIMARKER



PORTABLE FREQUENCY AND VOLTAGE STANDARDS

M-5 Multi/marker provides six precise frequencies at better than ±0.007% accuracy and a voltage calibration of better than ± 2.0%. Crystal controlled and Mallory TR-126 mercury battery operated it sustains an output voltage of >1 volt peak to peak. The Multi/marker is ideal for on the line calibration of the sweep and vertical amplifiers of oscilloscopes, as a portable secondary standard, trigger source for breadboard work, calibration of counters on the assembly line, signal generator, etc.

Price: $195.00 with leather case

M-6 low frequency adapter when used with the M-5 Multi/marker, provides frequencies of 10 cps, 1 cps and .1 cps with an output voltage of > 1.5V p/p. The M-6 adapter may also be used as a frequency divider with division factors of 10, 100, and 1000. When used as a divider an input voltage of negative polarity > 1.5V p/p, less than 2 kc maximum PRF is required. Frequency accuracy is the same as the M-5 Multi/marker. The M-6 is easily attached to the Multi/marker with a UHF connector or a coaxial cable.

Price: $145.00

FREQUENCY	PERIOD	WAVEFORM	RISE TIME	OUTPUT IMPEDANCE
10 mc	.1 µsec.	Spike	< 10 nanosec.	100Ω
1 mc	1 µsec.	"	< 90 nanosec.	"
100 kc	10 µsec.	"	<500 nanosec.	1KΩ
10 kc	100 µsec.	"	< 5 µsec.	"
1 kc	1 msec.	"	< 10 µsec.	"
100 cps	10 msec.	"	<100 µsec.	10KΩ
1 kc	1 msec	Square	1V p/p ±0.5%	"
10 cps	.1 sec	Spike	< 5 µsec.	10KΩ
1 cps	1 sec.	"	"	"
.1 cps	10 sec.	"	"	"

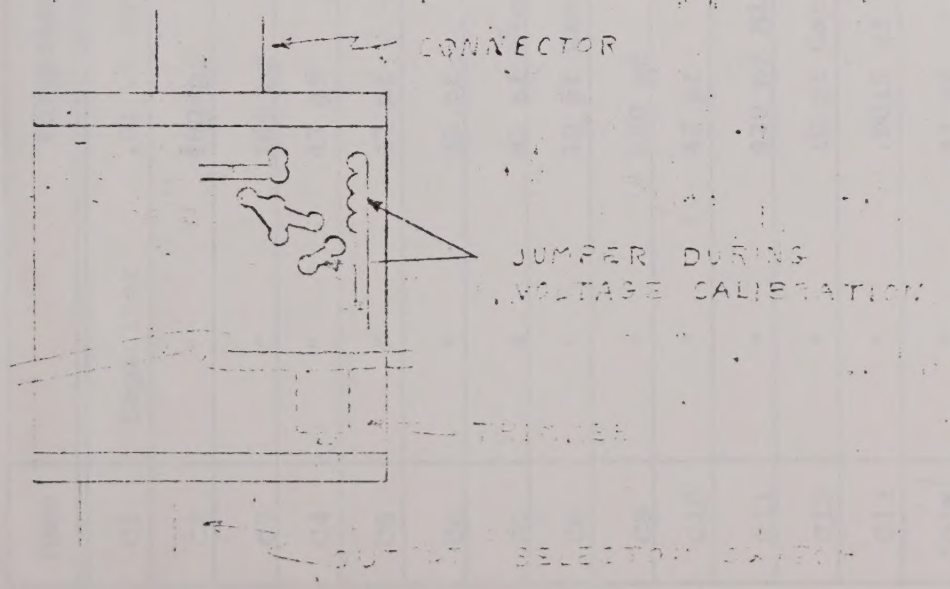
Manufactured by

accutronics, inc.
12 South Island Avenue/Batavia, Illinois/Phone 879-1600 Area Code 312

MULTI/MARKER VOLTAGE CALIBRATION

Should it become necessary to recalibrate the one volt, 1000 cps square wave output observe the following procedure:

1. Remove the Multi/marker cover.
2. Connect the unit to the DC input of a VTVM having an accuracy greater than 0.05%
3. Clip a jumper wire to the common line running along the right edge of the top printed circuit board.
4. Short the other end of the jumper wire to the base of the transistor located at the right rear of the top circuit board. (see pictoral diagram)
5. Place the output selector switch on volt. cal.
6. Adjust the trimmer through the access hole on the front panel for one (1) volt DC as indicated on the VTVM.
7. Turn the output selector switch to off.
8. Remove the jumper wire and replace the Multi/marker cover.
9. The unit is now calibrated to produce a square wave output on the volt. cal. position of one (1) volt peak to peak.



MULTI/MARKER PARTS LIST

accutronics, inc.

batavia, illinois parts list no. _____ schematic no. _____ layout no. _____

item	component description	mfgr. part no.	mfgr.	vendor
C1	Capacitor .01 µf Ceramic			
C2	" 180 pf "			
C3	" 150 pf "			
C4	" 47 pf "			
C5	" 47 pf "			
C6	" 30 pf "			
C7	" 43 pf Mica			
C8	" 10 pf Ceramic			
C9	" 220 pf "			
C10	" 47 pf "			
C11	" 470 pf Mica			
C12	" 10 pf Ceramic			
C13	" .0015 µf Ceramic			
C14	" 47 pf Ceramic			
C15	" .0047 µf Ceramic			
C16	" 15 pf Mica			
C17	" .003 µf Ceramic			
C18	" 47 pf Ceramic			

accutronics, inc.

batavia, illinois parts list no. _____ schematic no. _____ layout no. _____

item	component description			mfgr. part no.	mfgr.	vendor
C19	Capacitor	.047 µf	.05 Mallory PVC			
C20	"	[illegible] pf	Ceramic 68pf			
C21	"	.01 µf	Ceramic			
C22	"	47 pf	Ceramic			
C23	"	.47 µf	Mallory PVC			
C24	"	470 pf	Ceramic			
C25	"	.05 µf	Mallory PVC			
R1	Resistor	39K	1/4W			
R2	"	1K	1/4W			
R3	"	680Ω	1/4W			
R4	"	100Ω	1/4W			
R5	"	4.7K	1/4W			
R6	"	3.9K	1/4W			
R7	"	selected				
R8	"	31.6K 1%				
R9	"	1K 1%				
R10	"	1K 1%				

accutronics, inc.

batavia, illinois parts list no. _____ schematic no. _____ layout no. _____

item	component description	mfgr. part no.	mfgr.	vendor
R11	Resistor 2K 1/4W 5%			
R12	" 2K 1/4W 5%			
R13	" 100Ω 1/4W			
R14	" 4.7K 1/4W			
R15	" 3.9K 1/4W			
R16	" selected			
R17	" 31.6K 1%			
R18	" 1K 1%			
R19	" 1K 1%			
R20	" 4.3K 5% 1/4W			
R21	" 4.3K 5% 1/4W			
R22	" 100Ω 1/4W			
R23	" 4.7K 1/4W			
R24	" 3.9K 1/4W			
R25	" selected			
R26	" 31.6K 1%			
R27	" 2.21K 1%			
R28	" 2.21K 1%			

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batavia, illinois parts list no. _____ schematic no. _____ layout no. _____

item	component description			mfgr. part no.	mfgr.	vendor
R29	Resistor	20K	5% 1/4W			
R30	"	10K	1/4W			
R31	"	1k	1/4W			
R32	"	4.7K	1/4W			
R33	"	3.9K	1/4W			
R34	"	selected				
R35	"	31.6K	1%			
R36	"	2.21K	1%			
R37	"	2.21K	1%			
R38	"	1K	1%			
R39	"	1K	1/4W			
R40	"	4.64K	1%			
R41	"	5KΩ trimpot		3067P-1-502	Bourns	Allied
R42	"	5.23K	1%			
R43	"	4.7K	1/4W			
R44	"	3.9K	1/4W			
R45	"	selected				
R46	"	31.6K	1%			

form — 21

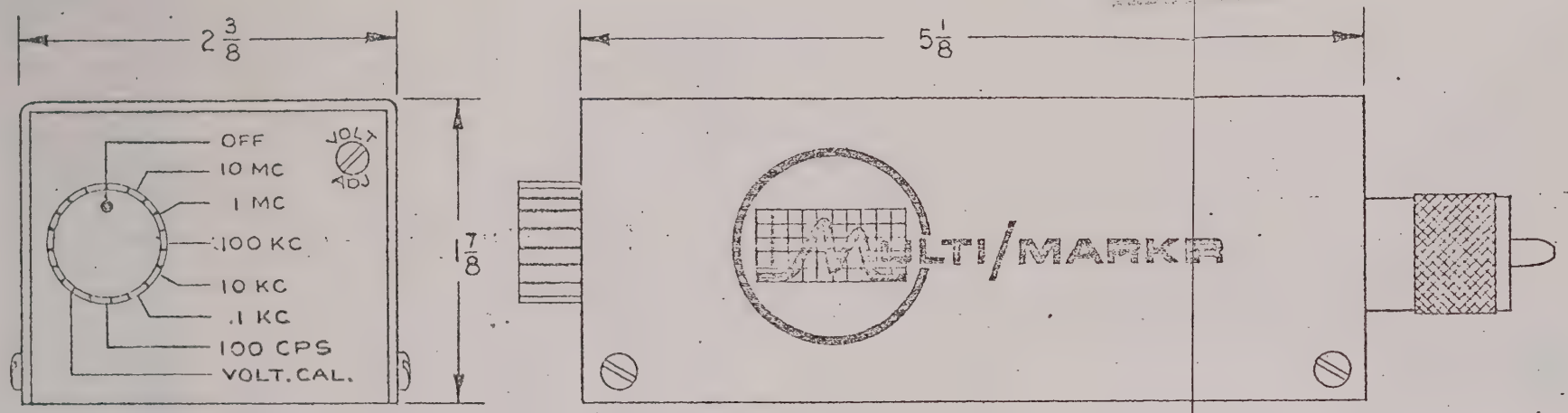
accutronics, inc.

batavia, illinois parts list no. _____ schematic no. _____ layout no. _____

item	component description			mfgr. part no.	mfgr.	vendor
R47	Resistor	2.21K	1%			
R48	"	2.21K	1%			
R49	"	[illegible]	1/4W 20 K			
R50	"	10K	1/4W			
R51	"	10K	1/4W			
D1	Diode	1N914				
D2	"	1N914				
D3	"	1N914				
D4	2.4V zener					
D5	Diode	1N3069				
Q1 thru Q17	Transistor selected	2n706A				
X1	Crystal	10 mc				

form — 21

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED



SPECIFICATIONS

FREQUENCIES:	100 CPS, 1KC, 10KC, 100 KC, 1MC, 10 MC
FREQUENCY TOLERANCE:	± 0.007% OR BETTER
TEMPERATURE RANGE:	0°C TO +60°C
OUTPUT VOLTAGE:	>1 VOLT P/P
INPUT VOLTAGE:	BATTERY (MALLORY TR-126 - MERCURY)
WAVEFORM:	SEE TABLE
OUTPUT IMPEDANCE:	SEE TABLE

TABLE 1

FREQUENCY	PERIOD	WAVEFORM	RISE TIME	OUTPUT IMPEDANCE
10 MC	.1 μSEC	SPIKE	< 10 NANOSEC	100 Ω
1 MC	1 μSEC	"	< 90 NANOSEC	"
100 KC	10 μSEC	"	< 500 NANOSEC	1KΩ
10 KC	100 μSEC	"	< 5 μSEC	"
1 KC	1 MSEC	"	< 10 μSEC	"
100 CPS	10 MSEC	"	< 100 μSEC	"
1 KC	1 MSEC	SQUARE	1V P/P CALIBRATOR ±5%	10KΩ

PRICE: $ 175 00

TERMS: 1/2 - 1% - 10, NET 30
FOB BATAVIA

NOTE:
FOR BLOCK DIAGRAM SEE DWG. 5019 SHEET 2

YOUR ACCUTRONICS REPRESENTATIVE:

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES AND APP
AFTER PLATING AND HEAT TREAT.
TOLERANCES ARE:
FRACTIONS ± DECIMALS ± ANGS ±
ROUGHNESS OF ALL MACH. SURFACE
√ PER MIL-STD-10
FREE FROM BURRS
CBORE & SPOTFACE CORNER R .010 M
BREAK SHARP CORNERS WHERE SPECIF
MATERIAL

DRAWN VIC.	3.9.63
APPD G.T.	3/11/63
CHECKED	3/11/63
APPD	3-12-63
RECORDED	

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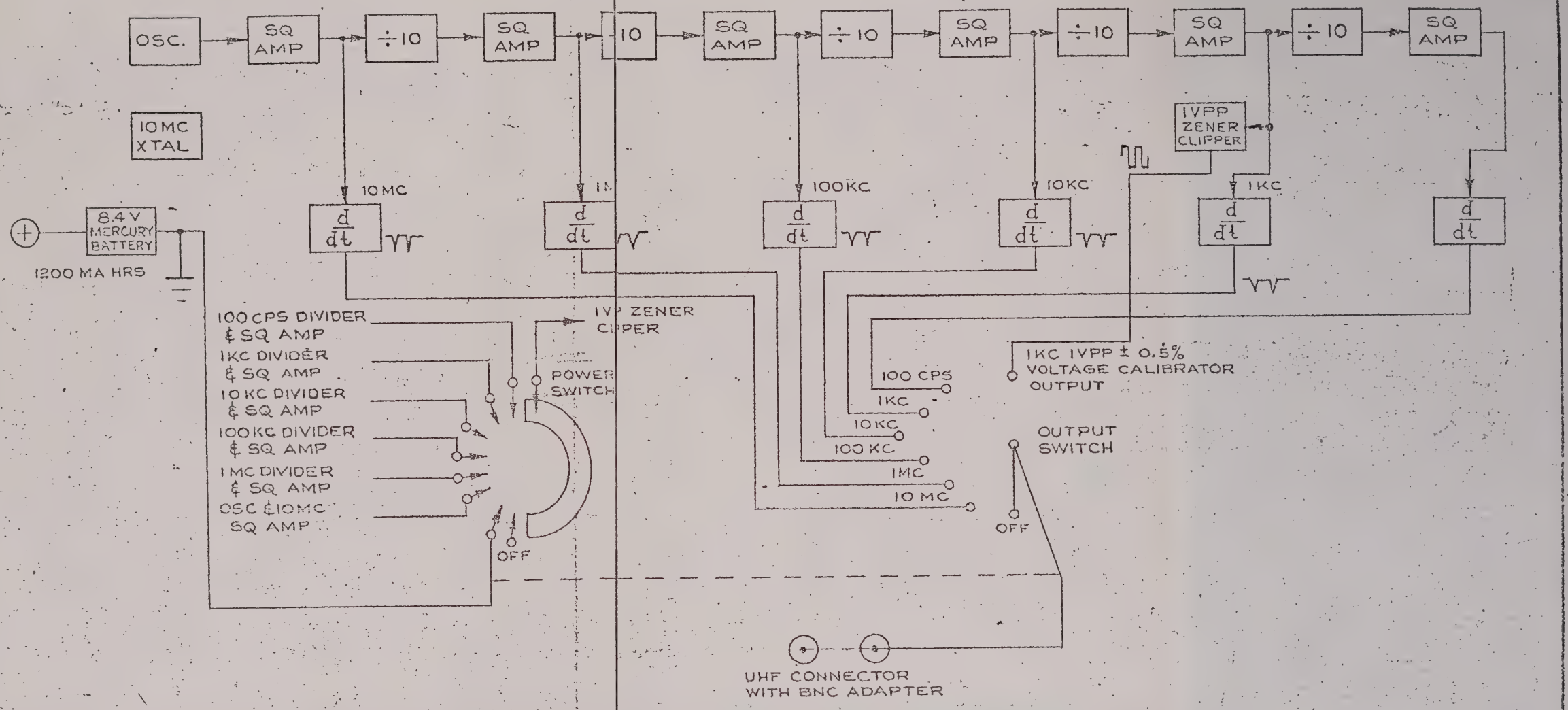
MULTI/MARKER MODEL #M5
MULTIPLE FREQUENCY TIME MARK GENERATOR AND VOLTAGE CALIBRATOR

CODE IDENT NO.	SIZE	DWG NO.
	B	5019

SCALE	WT ACT.	LB	WT CALC	LB	SHEET 1 OF 2

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED



UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES AND APPLY AFTER PLATING AND HEAT TREAT. TOLERANCES ARE:

FRACTIONS ± DECIMALS ± ANGLES ±

ROUGHNESS OF ALL MACH. SURFACES

√ PER MIL-STD-10

FREE FROM BURRS

CBORE & SPOTFACE CORNER R .010 MAX

BREAK SHARP CORNERS WHERE SPECIFIED

MATERIAL

DRAWN	VIC.	3-11-63
APPD	G.T.	3-12-63
CHECKED	W.F.	3/12/63
APPD	Jan	3-12-63
RECORDED		

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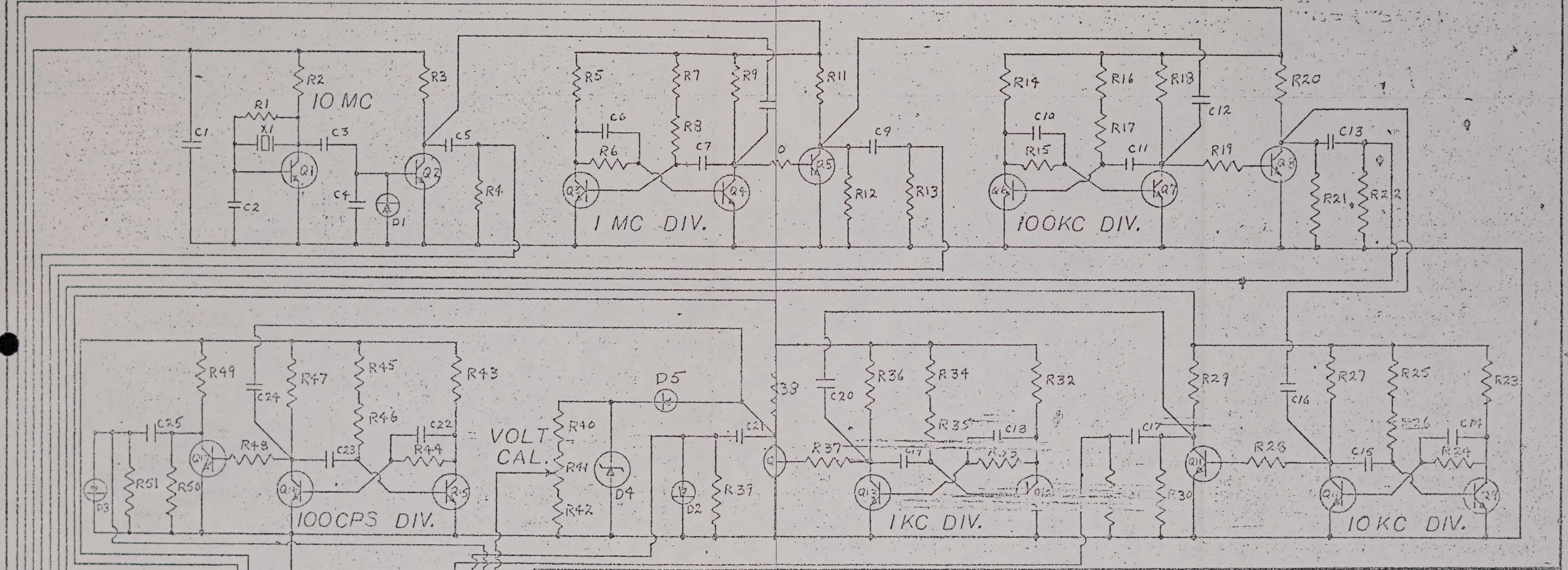
12 S. Island Ave./ Batavia, Illinois Area Code 312-TR9-1000

MULTI/MARKER MODEL # M5
BLOCK DIAGRAM

CODE IDENT NO.	SIZE	DWG NO.
	B	5019

SCALE	WT ACT.	LB WT CALC	LB	SHEET 2 OF 2

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED



UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES AND APPLY AFTER PLATING AND HEAT TREAT.

TOLERANCES ARE:

FRACTIONS ± DECIMALS ± ANGL ±

ROUGHNESS OF ALL MACH. SURFACES √ PER MIL-STD-10

FREE FROM BURRS

CBORE & SPOTFACE CORNER R .010 MA

BREAK SHARP CORNERS WHERE SPECIFIE

MATERIAL

DRAWN	JLT	6/25/64
APPD		
CHECKED		
APPD		
RECORDED		

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MULTI/MARKER
M-5

CODE IDENT NO.	SIZE	DWG NO.
	B	5019-2

SCALE	WT ACT.	LB	WT CALC	LB	SHEET

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